Multiple Angle Equations

Name_____ Date _____ Period _____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Find all real numbers that satisfy the equation.

1) $\cos(x/2) = \frac{1}{2}$ 1) _____

2) $\cos(3x) = 1$ 2) _____

3) $2\sin(x/2) - 1 = 0$ 3) _____

4) $2\sin(2x) = -\sqrt{2}$ 4) _____

5) $\tan(2x) = \sqrt{3}$ 5) _____

6) $\tan(4x) = 0$ 6) _____

Find all values of θ in $[0°, 360°)$ that satisfy the equation.

7) $2\sin(2\theta) + \sqrt{3} = 0$ 7) _____

8) $2\cos(2\theta) + 1 = 0$ 8) _____

9) $\sqrt{2}\cos(2\theta) - 1 = 0$ 9) _____

Find all real numbers in $[0, 2\pi]$ that satisfy the equation.

10) $2\cos(2x) - 1 = 0$ 10) _____

11) $\tan(3x) - 1 = 0$ 11) _____

12) $\sqrt{3}\tan(x/2) - 1 = 0$ 12) _____

Find all angles in degrees that satisfy the equation. Round approximate answers to the nearest tenth of a degree.

13) $\sin 3\alpha = 0.34$ 13) _____

Determine the period, asymptotes, and range of the function.

14) $y = \cot\left(2x + \frac{\pi}{2}\right)$ 14) _____

Find the exact value of the expression without using a calculator or table.

15) $\sin^{-1}\left(\frac{\sqrt{2}}{2}\right)$ 15) _____

16) $\cos^{-1}\left(\frac{\sqrt{3}}{2}\right)$ 16) _____

17) $\cot^{-1}(-1)$ 17) _____

Solve the equation.

18) $6\cos(\alpha) + 3 = 0$ for $0° \le \alpha \le 360°$ 18) _____

Answer Key
Testname: MULTIPLE ANGLE EQUATIONS WS

1) $\left\{x \mid x = \frac{7\pi}{12} + k\pi \text{ or } x = \frac{11\pi}{12} + k\pi\right\}$
2) $\left\{x \mid x = \frac{\pi}{12} + k\pi \text{ or } x = \frac{11\pi}{12} + k\pi\right\}$
3) $\left\{x \mid x = \frac{7\pi}{12} + k\pi \text{ or } x = \frac{11\pi}{12} + k\pi\right\}$
4) $\left\{x \mid x = \frac{\pi}{12} + k\pi \text{ or } x = \frac{11\pi}{12} + k\pi\right\}$
5) $\left\{x \mid x = \frac{k\pi}{4}\right\}$
6) $\left\{x \mid x = \frac{k\pi}{4}\right\}$
7) {30°, 60°, 210°, 240°}
8) {30°, 60°, 210°, 240°}
9) {300°}
10) $\frac{\pi}{8}, \frac{7\pi}{8}, \frac{9\pi}{8}, \frac{15\pi}{8}$
11) $\frac{\pi}{8}, \frac{7\pi}{8}, \frac{9\pi}{8}, \frac{15\pi}{8}$
12) $\frac{\pi}{8}, \frac{7\pi}{8}, \frac{9\pi}{8}, \frac{15\pi}{8}$
13) {$\alpha \mid \alpha$ = 12.1° + k120° or α = 47.9° + k120°}
14) 1
15) $\frac{\pi}{4}$
16) $\frac{\pi}{6}$
17) $\frac{3\pi}{4}$
18) {120°, 240°}